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10/759,235	01/20/2004	Byoung-Chul Kim	P57009	7206

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EXAMINER	
SHIN, KYUNG H	

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2443	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,235	KIM ET AL.	
	Examiner	Art Unit	
	Kyung Hye Shin	2443	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responding to application amendments filed on 1-26-2009. Claims **1 - 10** are pending. Claims **1, 2, 7, 9** are independent. File date is 1-20-2004 and foreign priority date is 1-30-3003 .

Response to Arguments

2. Applicant's arguments have been fully considered but they are partially moot due to new grounds of rejection.

2.1 Applicant argues, *routing information not shared by plurality of ports*.

The claim limitation is for routing information to be shared. Examiner has not found any disclosure other than the information must be shared or the information is available and used by all routers. Civanlar discloses that routing information is forwarded to all routers; therefore all routing information is available and shared by all routers. (Civanlar col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database; information shared between routing entities)

2.2 Applicant argues that the referenced prior art does not disclose, *a switching module that shares routing information*.

The sharing routing information disclosure has been discussed by the previous response. Civanlar discloses a switching module. (Civanlar col 2, ll 41-44: switching fabric coupled with a plurality of intelligent router ports; col 4, ll 8-11:

each router port performs functions of a conventional router)

2.3 Applicant argues that the referenced prior art does not disclose, *inserting new routing information into a routing table; deleting routing information from a routing table*.

Updated configuration or routing data (interpreted as modifications which can be interpreted as additions and deletions) is forwarded to all routers. (Civanlar col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database; information transferred, available, or shared between routing entities)

2.4 Applicant argues, *just searching does not address the insertion of routing information*.

Civanlar discloses the insertion or updating of new configuration or routing information into a routing table. And, Venkatachary discloses the searching of routing information within a tree data structure. Venkatachary discloses various aspects of searching a tree data structure as disclosed by the Office Action citations.

2.5 Applicant argues that the referenced prior art does not disclose, *reset and try different branch, the switch pointer.*

Venkatachary discloses searching a tree data structure of routing information and the switch pointer is utilized in searching of the tree data structure. Civanlar discloses updating or inserting routing information into a routing table.

Venkatachary discloses restarting or resetting a search of routing information. (Venkatachary col. 16, lines 26-36: switch pointer; reset and restart search)

2.6 The reference (7,382,769) indicated by Applicant concerning routing information does not appear to be concerned with searching routing information and/or the insertion of routing information into a routing table. The only disclosure of inserting in this reference is in relation to inserting a card into a slot in a chassis. Civanlar discloses inserting information into a routing table. The indicated reference does mention updating (or inserting) routing information as also disclosed in Civanlar.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim **1** is rejected under 35 U.S.C. 103 (a) as being unpatentable over **Civanlar et al.** (US Patent No. **6,078,963**) in view of **Dobbins et al.** (US Patent No. **5,951,649**).

Regarding Claim 1, Civanlar discloses a distributed router comprising:

a) a plurality of routing nodes each having a plurality of routing protocol processing units, with each routing protocol processing unit; (Civanlar col. 2, lines 53-55: coupled to network nodes such as routers/switches in a overall network (plurality of routers); col 3, ll 37-41: any known types of routing protocols packets may be received (OSPF, RIP, BGP4))

b) a switching module having a plurality of routing protocol processing units communicatively connected with the routing protocol processing units of each of the routing nodes, with the switching module disposed to share in real time routing information collected by each of the routing nodes with others of the routing nodes. (Civanlar col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database; col 3, ll 37-41: any known types of routing protocols packets may be received (OSPF, RIP, BGP4); col 2, ll 41-55: switching fabric coupled with plurality of router ports; col 4, ll 8-11: router port may perform some or all functions of a conventional router)

Civanlar does not explicitly disclose processing data in accordance with a respectively corresponding routing protocol. However, Dobbins discloses wherein processing data in accordance with a respectively corresponding routing protocol. (**Dobbins** col 7, ll 33-38: each forwarding engine knows how to receive and transmit packets on its own interface or the one interface it is associated with; col 15, ll 54-56: provides protocol-specific configuration information for each attached network interface)

It would have been obvious to one of ordinary skill in the art to modify Civanlar for processing data in accordance with a respectively corresponding routing protocol as taught by Dobbins. One of ordinary skill in the art would have been motivated to employ the teachings of Dobbins for an extremely flexible, scaleable, and adaptive

architecture for different hub configurations and able to support a variety of present and future protocols. (**Dobbins** col 1, ll 54-58)

4. Claims **2 - 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Civanlar** in view of **Venkatachary et al.** (US Patent No. **6,212,184**).

Regarding Claim 2, Civanlar discloses a method of managing forwarding information, comprising the steps of:

when new routing information is to be inserted into a routing table in a distributed router in which all routing nodes share a forwarding information. (Civanlar col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database; information transferred, available, or shared between routing entities)

Civanlar discloses the insertion of routing information into a routing table. Civanlar does not explicitly disclose an aggregation tree for routing information. However, Venkatachary discloses:

(1) wherein an aggregation tree based on the routing table, detecting a position at which an insertion node corresponding to the new routing information is to be inserted into the aggregation tree; (Venkatachary col. 15, lines 50-60: search and update (insert) location routing information)

(2) determining presence and absence of an ancestor node of the insertion node at or below a predetermined maximum aggregation level with respect to the

insertion node; (Venkatachary col. 10, lines 6-33; col 16, ll 26-36: determine existence or presence of ancestor node)

(3) leaving a forwarding table un-updated with information about the insertion node in a presence of the ancestor node, when forwarding information corresponding to the ancestor node is in the forwarding table and the insertion node and both of the ancestor node have been generated from a common source area; (Venkatachary col. 16, lines 37-52: switch pointer inserted when nil; no node exists)

(4) in an absence of the ancestor node, resetting the aggregation level to a reset aggregation level not greater than the maximum aggregation level, and inserting forwarding information corresponding to a delegation node representative of the insertion node at the reset aggregation level in the forwarding table; (Venkatachary col. 16, lines 26-36: switch pointer; reset to ancestor node level in searching tree) and

(5) making an insertion of forwarding information by determining the source area of the routing information to be inserted, inserting forwarding information corresponding to the delegation node in the forwarding table when the source area of the routing information is a virtual area, and inserting forwarding information corresponding to the insertion node in the forwarding table when the source area of the routing information is a local area. (Venkatachary col. 15, lines 50-60: update (insert) location forwarding information)

It would have been obvious to one of ordinary skill in the art to modify Civanlar

to utilize ***an aggregation tree for routing information*** as taught by Venkatachary. One of ordinary skill in the art would have been motivated to employ the teachings of Venkatachary for providing routers and routing methods that do not require either huge memory requirements or large lookup times. (**Venkatachary** col 9, ll 52-55)

Regarding Claim 3, Civanlar discloses the method of claim 2. (Civanlar col. 2, lines 53-55: coupled to network nodes such as routers/switches in an overall network; col. 3, lines 41-47: forwarding engine configured to forward new or updated routing table configuration data to every other router port for updating database; information transferred, available, or shared between routing entities) Civanlar discloses the insertion of routing information into a routing table. Civanlar does not explicitly disclose an aggregation tree for routing information. However, Venkatachary discloses wherein comprised of, before making said insertion of forwarding information, and when a delegation node is found to exist at the position of the insertion node while detecting a position at which an insertion node corresponding to the new routing information is to be inserted into the aggregation tree, deleting from the forwarding table forwarding information corresponding to the delegation node. (Venkatachary col. 15, lines 50-60: update location forwarding information)

The motivation to employ the teachings of Venkatachary is same as stated in claim 2 above.

Regarding Claim 4, Civanlar discloses the method of claim 2. (Civanlar col. 2, lines

53-55: coupled to network nodes such as routers/switches in an overall network; col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database; information transferred, available, or shared between routing entities)

Civanlar does not explicitly disclose an aggregation tree for routing information. However, Venkatachary discloses wherein comprised of: a) before making said insertion of forwarding information when a delegation node is found to exist at the position of the insertion node while detecting said position at which an insertion node corresponding to the new routing information is to be inserted into the aggregation tree, and when a left/right subtree of the delegation node exists, reinserting nodes of the left/right subtree, and deleting forwarding information corresponding to the delegation node from the forwarding table. (Venkatachary col. 10, lines 6-33; col 16, ll 26-36: search forwarding information; col. 15, lines 50-60: update (insert, delete) location forwarding information)

The motivation to employ the teachings of Venkatachary is same as stated in claim 2 above.

Regarding Claim 5, Civanlar discloses the method of claim 2. (Civanlar col. 2, lines 53-55: coupled to network nodes such as routers/switches in an overall network; col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database; information transferred, available, or shared between routing entities)

Civanlar discloses the insertion of routing information into a routing table. Civanlar does not explicitly disclose an aggregation tree for routing information. However, Venkatachary discloses wherein leaving a forwarding table un-updated with information about the insertion node in a presence of the ancestor node, when forwarding information corresponding to the ancestor node is in the forwarding table and both of the insertion node and the ancestor node have been generated from a common source area, comprising the steps:

when the ancestor node of the insertion node is found to exist at or below the maximum aggregation level while determining said presence and absence of the ancestor node, searching for a descendant node of the insertion node; (Venkatachary col. 10, lines 6-33; col 16, ll 26-36: search tree; identify and locate ancestor node)

when a descendant node of the insertion node is found to exist, resetting the aggregation level according to a difference between the prefixes of forwarding information corresponding to the insertion node and the descendant node, and when no descendant nodes of the insertion node are found to exist, resetting the aggregation level according to the aggregation level of the ancestor node of the insertion node; (Venkatachary col. 16, lines 26-36: switch pointer; reset and try different branch for searching)

inserting the forwarding information corresponding to the insertion node in the forwarding table when the reset aggregation level is zero; when the reset aggregation level is greater than zero; and determining the source area of the

inserted routing information, inserting the forwarding information corresponding to the delegation node in the forwarding table when the source area is a virtual area, and inserting the forwarding information corresponding to the insertion node in the forwarding table when the source area is a local area. (Venkatachary col. 15, lines 50-60: search and update (insert) location routing information; col. 16, lines 26-36: reset and try different branch)

The motivation to employ the teachings of Venkatachary is same as stated in claim 2 above.

Regarding Claim 6, Civanlar discloses the method of claim 2. (Civanlar col. 2, lines 53-55: coupled to network nodes such as routers/switches in an overall network; col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database)

Civanlar does not explicitly disclose an aggregation tree for routing information. However, Venkatachary discloses wherein comprised of performing said steps of

resetting the aggregation level to a reset aggregation level not greater than the maximum aggregation level in an absence of the ancestor node, and inserting a delegation node representative of the insertion node at the reset aggregation level, by: setting a search level range whether the ancestor node of the insertion node exists within the search level range; when the ancestor node of the insertion node exists within the search level range, determining whether a descendant node of the deletion node representative of the insertion node exists at the maximum aggregation level; (Venkatachary col. 16, lines 26-36: switch pointer; reset and try

different branch)

resetting the aggregation level according to a difference between the prefixes of the insertion and the descendant node of the delegation node when the descendant node of the delegation node exists at the maximum aggregation level; and inserting the forwarding information corresponding to the delegation node of the insertion node at the reset aggregation level in the forwarding table. (Venkatachary col. 16, lines 26-36: switch pointer; reset and try different branch)

The motivation to employ the teachings of Venkatachary is same as stated in claim 2 above.

Regarding Claim 7, Civanlar discloses a method of managing forwarding information and a distributed router in which all routing nodes share forwarding information assembled according to an aggregation tree based on the routing table. (Civanlar col. 2, lines 53-55: coupled to network nodes such as routers/switches in an overall network; col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database) Civanlar does not explicitly disclose an aggregation tree for routing information. However, Venkatachary discloses wherein comprising the steps:

when routing information is to be deleted from a routing table in detecting a deletion node corresponding to the routing information to be deleted in the aggregation tree; (Venkatachary col. 15, lines 50-60: search and update (insert) forwarding information)

when forwarding information corresponding to the deletion node is in a forwarding table, searching for a descendant node of the deletion node at a predetermined maximum aggregation level; (Venkatachary col 10, ll 6-33; col 16, ll 26-36: search for a descendent (ancestor) node) and

when a descendant node of the deletion node exists at an aggregation level not greater than a predetermined maximum aggregation level, setting the descendant node as a new source node of a delegation node, and when no descendant nodes exist for the deletion node at an aggregation level not greater than a predetermined maximum aggregation level, deleting the forwarding information corresponding to the deletion node from the forwarding table. (Venkatachary col. 15, lines 50-60: search and update (delete) forwarding information)

The motivation to employ the teachings of Venkatachary is same as stated in claim 2 above.

Regarding Claim 8, Civanlar discloses the method of claim 7. (Civanlar col. 2, lines 53-55: coupled to network nodes such as routers/switches in an overall network; col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database)

Civanlar does not explicitly disclose an aggregation tree for routing information. However, Venkatachary discloses wherein comprising the step of, the deletion node is a source node that created a delegation node, changing forwarding information corresponding to the delegation node in conformance with the forwarding information

corresponding to the deletion node. (Venkatachary col. 15, lines 50-60: search and update (delete) forwarding information)

The motivation to employ the teachings of Venkatachary is same as stated in claim 2 above.

5. Claims **9, 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Civanlar-Venkatachary** and further in view of **Dobbins**.

Regarding Claim 9, Civanlar discloses a distributed architecture router, comprising:

a switching module accommodating a plurality of routing protocol processing units while managing forwarding information within the distributed architecture router. (Civanlar col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database; col 3, ll 37-41: any known types of routing protocols packets may be received (OSPF, RIP, BGP4))

a plurality of routing nodes each of the routing nodes being disposed to service networks within different corresponding source areas comprised of local areas, with each routing node having a plurality of routing protocol processing units communicatively connected with corresponding routing protocol processing units in said switching module to form a source area comprising a virtual area and share in real time collected routing information assembled by a routing table. (Civanlar col. 2, lines 53-55: coupled to network nodes such as routers/switches in a overall network; col 3, ll 37-41: any known types of routing protocols packets may be received

(OSPF, RIP, BGP4))

Civanlar does not explicitly disclose an aggregation tree for routing information and processing data in accordance with a corresponding routing protocol. However, Venkatachary discloses wherein an aggregation tree derived from routing table information. (Venkatachary col 9, l 64 - col 10, l 5: search a tree for a lowest cost match and routing the packet)

And, Dobbins disclose wherein processing data in accordance with a respectively corresponding routing protocol. (Dobbins col 7, ll 33-38: each forwarding engine knows how to receive and transmit packets on its own interface or the one interface it is associated with; col 15, ll 54-56: provides protocol-specific configuration information for each attached network interface)

The motivation to employ the teachings of Venkatachary and Dobbins are same as stated in claims 2, 1 above.

Regarding Claim 10, Civanlar discloses the distributed architecture router of claim 9, comprised of said routing nodes responding to insertion of new routing information into said routing table. (Civanlar col. 2, lines 53-55: coupled to network nodes such as routers/switches in an overall network; col. 3, lines 41-47: forwarding engine configured to forward new routing table configuration data to every other router port for updating database)

Civanlar does not explicitly disclose an aggregation tree for routing information. However, Venkatachary discloses wherein:

identifying in said aggregation tree a position for addition of an insertion node corresponding to said new routing information; (Venkatachary col. 15, lines 50-60: search and update (insert) forwarding information)

making a search of said aggregation tree within a maximum aggregation level to identify an ancestor node of said insertion node; (Venkatachary col. 10, lines 6-33; col 16, ll 26-36: search tree; identify and locate ancestor node)

forgoing updating of said forwarding table with forwarding information corresponding to said insertion node when said insertion node and said ancestor node were generated from the same source area and said search identifies said ancestor node; (Venkatachary col. 16, lines 37-52: no update; no node at location)

resetting said maximum aggregation level to a reset aggregation level not less than said maximum aggregation level when said search fails to identify said ancestor node and adding a delegation node representative of said insertion node at said reset aggregation level; (Venkatachary col. 16, lines 26-36: switch pointer; reset and try different branch for searching)

making an identification of said source area of said new routing information; inserting said forwarding information corresponding to said delegation node when said identification establishes that said source area of said new routing information is a virtual area; (Venkatachary col. 15, lines 50-60: search and update (insert) location forwarding information) and

inserting said forwarding information corresponding to said insertion node when said identification establishes that said source area of said new routing information is

a local area. (Venkatachary col. 15, lines 50-60: search and update (insert) location forwarding information)

The motivation to employ the teachings of Venkatachary is same as stated in claim 2 above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyung Hye Shin whose telephone number is (571)272-3920. The examiner can normally be reached on 9:30 am - 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tonia L. Dollinger can be reached on (571) 272-4170. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kyung Hye Shin
Examiner
Art Unit 2443

KHS
April 26, 2009

/Tonia LM Dollinger/
Supervisory Patent Examiner, Art Unit 2443